GEOGRAPHIC NEWS BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

Contents for Week of May 5, 1941. Vol. XX. No. 10.

Photograph by Melville Chater

THE BIG DIAMONDS WILL WEAR VELVET, THE LITTLE ONES DON OVERALLS

In South African mines, which supply a quarter of the world's diamond output when not closed by war or depression crises, the diamond-bearing "blue earth" is washed across table-like surfaces covered with grease, to which the diamonds adhere while the dirt washes away. Then the diamonds are graded, by sorting through a succession of screens with holes of different sizes, before being shipped to Europe for their cutting. Large and flawless gems become the "idle rich" of the jewel world, taking their ease in jewelers' velvet-lined cases; but small or imperfect ones go to work, grinding tools in industrial plants, drilling oil wells, quarrying granite, or spraying jets of oil in oil-burning furnaces (Bulletin No. 5).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic News Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922.

GEOGRAPHIC NEWS BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

Contents for Week of May 5, 1941. Vol. XX. No. 10.

Photograph by Melville Chater

THE BIG DIAMONDS WILL WEAR VELVET, THE LITTLE ONES DON OVERALLS

In South African mines, which supply a quarter of the world's diamond output when not closed by war or depression crises, the diamond-bearing "blue earth" is washed across table-like surfaces covered with grease, to which the diamonds adhere while the dirt washes away. Then the diamonds are graded, by sorting through a succession of screens with holes of different sizes, before being shipped to Europe for their cutting. Large and flawless gems become the "idle rich" of the jewel world, taking their ease in jewelers' velvet-lined cases; but small or imperfect ones go to work, grinding tools in industrial plants, drilling oil wells, quarrying granite, or spraying jets of oil in oil-burning furnaces (Bulletin No. 5).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic News Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Iraq Presents Problem in Billion Dollar Diplomacy

BECAUSE of its importance as an international super "gas station," any change of policy in the government of Iraq (Mesopotamia) brings the triangular kingdom southeast of Turkey to the foreground of the war's eastern front.

Larger than Arizona, Iraq has a population of 3,500,000. Great Britain normally has relied on Iraq to supply her with about $5,000,000 worth of crude petroleum each year, in addition to about $8,500,000 in barley. Half of the nation's exports to the United States were dates; about $1,500,000 worth annually.

Former British Protectorate Set Up after World War

Since 1933, Iraq's petroleum output has quadrupled. Two pipe lines laid with the aid of Texas and Oklahoma oil workers normally funnel the oil from Kirkuk to the Mediterranean ports of Tripoli and Haifa.

The line to Tripoli through Syria has been reported shut off as a result of Syria's status as a French dependency. The southern section to Haifa, by way of Trans-Jordan and Palestine, was supplying the British Mediterranean fleet.

Iraq's present government was born of the World War. Freed then from Turkish rule, Iraq was placed under British protection, and Great Britain is said to have spent vast sums in putting the country on its feet. One English writer fixes the figure at nearly a billion dollars.

In 1927 the British entered into a treaty with Iraq, providing for ultimate independence of the country, and five years later the kingdom was admitted to the League of Nations.

Like other war-born nations, this Arabic-speaking Mohammedan country, dominated by Arabs, has its minority problems.

Rich in Biblical History

The Christians in the north alone include nine different groups. The most important are the Assyrians driven out of Turkey after the World War. Along the mountainous Persia-Iraq frontier are the Kurds. Toward Syria are the Yezidis, reputed to be devil-worshippers.

This rich Mesopotamian region has been fixed upon by historians as the site of the Garden of Eden and the Tower of Babel. Biblical and Persian eras were followed by the period of the Arabian Nights, when Sindbad the Sailor, bound for adventure, sailed from Basra on the Persian Gulf, and Ali Baba caught his Forty Thieves in Iraq's capital city of Baghdad.

On modern Baghdad three air routes converge. American-made buses with air-cooled interiors follow old caravan trails across the desert. The peace of the Garden of Eden is disturbed by the whistle of passing locomotives. Modern irrigation is replacing early irrigation works in use before the Mongol invasion.

Note: See also "Change Comes to Bible Lands," *National Geographic Magazine*, December, 1938; "New Light on Ancient Ur," January, 1930; "Archeology, the Mirror of the Ages," August, 1928; and "Visit to Three Arab Kingdoms," August, 1925.

And in the GEOGRAPHIC NEWS BULLETINS: "Oil of Near East Involves U. S. and 11 Other Countries," November 11, 1940; "Modern Spillway for Ancient Euphrates, Garden of Eden River," May 13, 1940; and "Iraq, Cradle of Civilization, Has Four-Year-Old King," April 24, 1939.

Iraq's oil pipe lines, pumping stations, and transportation routes are shown on The Society's Map of the Bible Lands. Paper copies of this map are available at 50¢; linen copies at 75¢. A folder describing this and other maps will be sent on request.

Photograph courtesy Mississippi River Commission

STREAMLINING THE STREAM OF OL' MAN RIVER HAS SHORTENED THE RIVER 120 MILES, WITH ADDED SPEED AND SAFETY

The "Greenville Bends" in the lower Mississippi take their name from Greenville (extreme right of picture). Cutoffs, or artificial channels cut between two sinuous bends, straighten the course considerably. Eleven man-made cutoffs and one carved by the river have reduced the channel length from 330 to 210 miles between the Arkansas and the Red Rivers. They also increase the "slope" of the river for normal navigation, and aid flood control by hurrying the high water along in times of danger. The photograph shows the Tarpley, Leland, and Ashbrook Cutoffs (Bulletin No. 4).

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Mysterious Chinese Drug Fruit Identified and Named

A DRUG plant brought from a remote part of China three years ago by a National Geographic Society expedition, and found to be unknown to botanical science, has finally been identified and given its proper classification in the plant world by Dr. Walter T. Swingle, botanist of the Department of Agriculture.

Dr. Swingle announces and describes the new plant in the April issue of the Journal of the Arnold Aboretum of Harvard University. He has given it the name *Momordica Grosvenori* in honor of Dr. Gilbert Grosvenor, President of the National Geographic Society, who, he states, "for many years has encouraged liberally the geographic and botanical exploration of China."

Plant Explorers Looked for Tree, Found Vine

The fruit, called "lo-han" by the Chinese and sometimes anglicized as lohon, has long been used in the dried form in outer China as a household remedy—made into a sweet soup—for colds, sore throat, minor stomach and intestinal ills, and for other ailments. Quantities valued at thousands of dollars are shipped annually to Chinese residents in America. But despite this wide use of the dried fruit, its source remained a mystery, and its classification baffled botanists.

Special importance has attached to Chinese drugs since the discovery, from the drug "ma huang," of the medicinal properties of ephedrin. Though it had many potential uses in medicine, ephedrin was unknown outside of China 25 years ago. Today, sales of the drug in the United States reach hundreds of thousands of dollars a year.

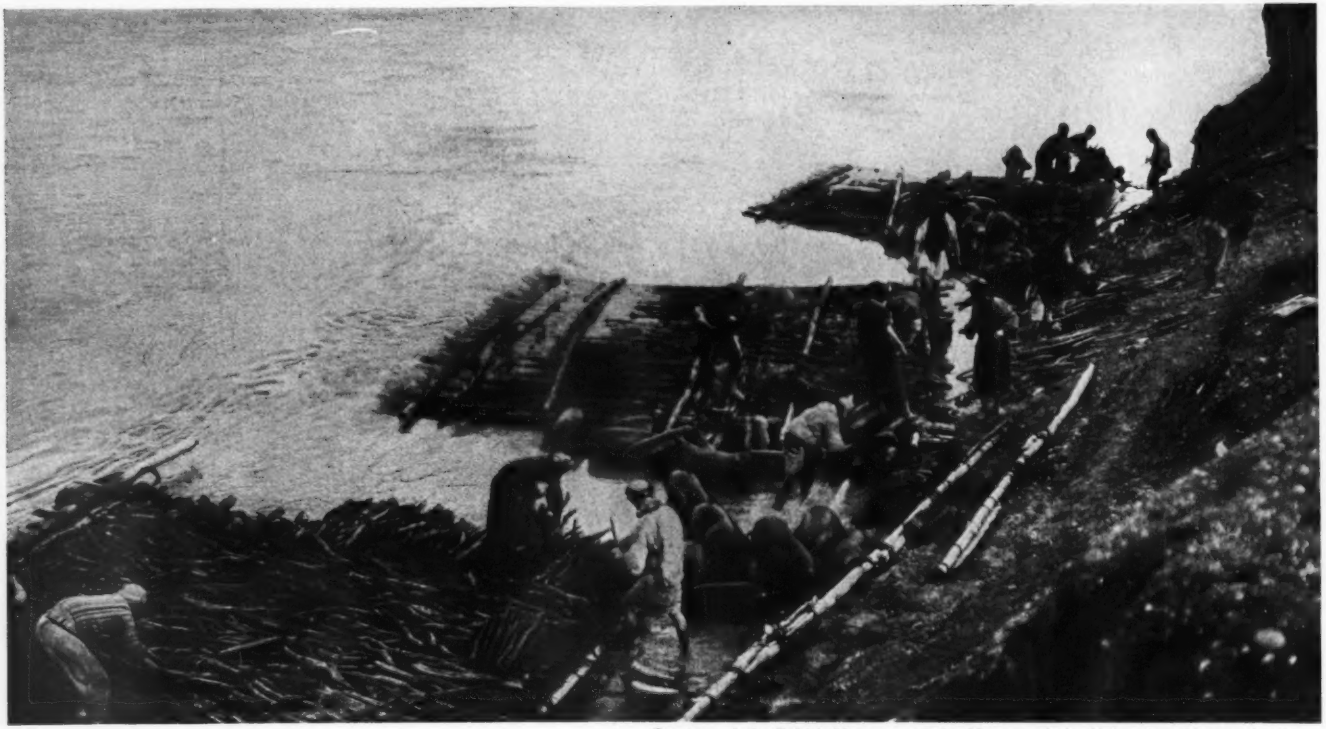
In Canton, one of the chief markets for the medicinal fruit, the lo-han was sold in paper wrappings, some of which pictured it as growing on trees. In 1937, an expedition under the leadership of Dr. George W. Groff, of Lingnan University, Canton, was sent by the National Geographic Society to find the "trees." Lo-han cultivation was finally located in the mountainous region of northeast Kwangsi Province, but the plant turned out to be a vine and the fruit gourdlike. Culture of the plant was found to be carried on by the Miao, a primitive, aboriginal people driven from the fertile lands of central China to this isolated mountainous area a century and a half ago. The territory of these non-Chinese people has remained closed to the Chinese, and Dr. Groff probably was the first white man to penetrate into this country.

Primitive People Follow Scientific Method

The dried fruit, photographs of the vine, specimens of leaves, flower, and fruit, with analytical drawings, were turned over to Dr. Swingle by the expedition. Dr. Swingle, an expert on Chinese plant life, spent months examining ancient Chinese herbals (treatises on plants), as well as botanical works of Europe and the United States. Lack of adequate material for study of the male flowers further complicated the problem of classification.

"It finally became evident, upon careful study of this material," Dr. Swingle writes, "that it constitutes a new species of Momordica, very distinct from any known to botanists."

The fruit grows on a vine which the Miao people train over rough horizontal arbors of saplings about 6 feet high. They utilize patches of land on the mountain slopes about 2,000 feet above sea level. The climate is semi-tropical but cool and rainy in summer.



Courtesy of the British Museum and the Museum of the University of Pennsylvania

FROM MOSUL ON THE TIGRIS, IT'S ALL ABOARD FOR BAGHDAD ON ANCIENT "STEAMERS" OF GOATSKIN AND STRAW

Mosul, although it has no petroleum, gives its name to Iraq's famous oil fields because it is the closest large city. The site of Mosul on the storied Tigris River has been of historic importance since the days of Nineveh, which was situated across the river. Lively commerce between Mosul and Baghdad has continued from earlier times, in spite of the slow, primitive craft still in use for carrying wool, grain, pottery, and any other commodities downstream to Iraq's capital. The native raft, or *kelek,* is a wooden framework covered with straw mats, and floated on inflated goatskins. Herodotus 2,400 years ago reported seeing such rafts in use on the Tigris.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Strategic Materials: No. 5, This Liquid Metal Mercury

SILVER melts and flows like a liquid at 961 degrees Centigrade, and gold, iron, and copper at temperatures above 1,000. But mercury, or quicksilver, is the only metal that is liquid at ordinary temperatures. This and other peculiar talents have won special jobs for mercury in civilian life and in national defense, of such importance that the liquid metal is rated as strategic.

In addition to the familiar mercury-in-glass thermometer (illustration, next page), quicksilver is the vital part of other precision measuring instruments from barometers, hydrometers, and thermostats to pressure gauges, essential to such functions as issuing storm warnings or preventing the explosion of steam boilers. Mercury barometers have been in use since 1643.

Fashionably dressed men and women may be surprised to know how much of their chic they owe to mercury, which serves them in dyestuffs and as the traditional substance for dressing felt into hats. About 10 per cent, many times more than thermometers require, of the quicksilver used in the United States goes into the millinery business to make hat felt soft and manageable.

An Esteemed Medicine in Days of Medieval Astrologers

Nearly half of this country's requirements of the metal serves the nation's health in the form of medicines, both healing and poisonous, including calomel, mercurochrome, and the deadly antiseptic, bichloride of mercury. The silvery liquid was prescribed even in medieval days when dosages called for ant's eggs, oil of scorpions, and lion's flesh. Children of the Dark Ages were doctored with mercury flavored with roses. In fact, while medicine was still a branch of astrology, in the 7th century, quicksilver first received the name of Mercury, Earth's companion planet. The ancient Greeks and Romans had called it "silver water."

A very modern use of the metal occurs in the field of electricity, where mercury-vapor lamps manufacture ultraviolet rays at the flip of a switch, mercury arc rectifiers transform alternating current to direct, and mercury boilers generate power. Mercury pumps create the vacuum in glass tubing for neon lights.

Comparable to the discovery of gunpowder in its effect on warfare was the discovery of mercury fulminate in 1799 by E. C. Howard. Named from the Latin for thunderbolt, fulminate explodes when subjected to heat, friction, or a sharp blow. Now it is used to ignite gunpowder or to set off a more powerful explosive, and is considered indispensable for Army purposes. Serving the Navy also, mercury makes an anti-fouling paint for ship bottoms (which discourages barnacles) and numerous sensitive measuring instruments and gauges, essential for navigation.

Strategic materials, according to official definition, are "those essential to national defense, for the supply of which, in war, dependence must be placed in whole, or in substantial part, on sources outside the continental limits of the United States; and for which strict conservation and distribution control measures will be necessary."

The GEOGRAPHIC NEWS BULLETINS are presenting a series of articles on the following strategic materials, describing their uses, qualities, and sources:

Antimony	*Mercury (No. 5)*	*Quinine (No. 2)*
Chromium	*Mica*	*Rubber*
Coconut Shell Char	*Nickel (No. 1)*	*Silk*
Manganese	*Quartz Crystal*	*Tin*
Manila Fiber (No. 4)		*Tungsten (No. 3)*

To the great surprise of the expedition members, it was found that the Miao cultivate only the female plants and fertilize them by hand pollination from male vines growing in the wild state scattered through the mountains. This is one of the very few cases known in which primitive people practice this highly artificial method of crop production.

Dried Fruits Bring 20 Cents Apiece

The fruit varies from the size of a hen's egg to that of a goose egg, and when ripe is greenish yellow or dull reddish brown. The dried shell is brittle and contains an excessively sweet fibrous material, and flat seeds somewhat similar to those of a watermelon, but larger and thicker.

As much as a thousand tons of the ripened lo-han fruit is delivered every year by the Miao growers to processors in the nearby Chinese city of Kweilin. The fruit is partially dried naturally, and then more than 80 per cent of the moisture is driven off by drying over charcoal fires. So highly is it prized in Chinese coastal cities that the dried fruits bring about 20 cents each in Canton silver and about as much in American money in the United States.

Note: See "Landscaped Kwangsi, China's Province of Pictorial Art," *National Geographic Magazine*, December, 1937. And in the GEOGRAPHIC NEWS BULLETINS: "Kwangsi Turned the Japanese Tide from South China," November 25, 1940; "Mystery of Lohon Plant Solved in Remote Area of China," November 1, 1937; and "Kwangsi Province, 'China's Dixie,' Goal of Expedition," May 10, 1937.

Kwangsi Province is shown on The Society's Map of Asia. For 50¢ (paper) or 75¢ (linen), this map may be obtained from The Society's Washington, D. C., headquarters.

Bulletin No. 2, May 5, 1941.

Photograph by T. C. Lau

A PONTOON BRIDGE HELPS MAKE KWEILIN A MEDICINAL CENTER

In the northeastern corner of China's tropical southwestern province of Kwangsi, Kweilin is 140 miles north of the province's principal commercial city, Wuchow. The modern highway connecting them can be traversed in a few hours, contrasting sharply with travel conditions of two decades ago, when the trip up the Kwei River from Wuchow to Kweilin took 17 days. Farmers on both sides of the Kwei bring their lo-han fruit to Kweilin for processing, crossing the pontoon bridge of 50 anchored boats chained together. Planks laid across the boats supply a walkway. This "elastic" bridge can adjust itself to the river, swinging out into a crescent with the current. Oiled-paper umbrellas shield merchants and their wares from the sun.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Ol' Man River Floats Heavy Traffic 400 Years after Discovery

"BY THE mark, twain!"

This spring people in the river towns along the Mississippi are harking back even beyond the times of the old steamship leadsman's call from which Mark Twain, the great stream's most famous chronicler, took his pen name. For this month the Mississippi Valley is celebrating the 400th anniversary of the discovery, in 1541, of the "Father of Waters" by the Spanish explorer, Hernando de Soto.

River of History and Commerce

Spanish conquistadores, French missionary-voyageurs, Indian raids, pioneers on flatboats and rafts, river pirates, white-columned plantation mansions, hundreds of ornate steamboats puffing 'round the bends, naval war and land siege in the War Between the States, levee, lock, and dam building, and today's barge flotillas—these have been mileposts of human history along the Mississippi.

The Mississippi, augmented by its tributaries, is one of the world's greatest rivers in length and volume. Its rank as a commercial artery is equally high. From the head of the Missouri, the Mississippi's longest tributary, to the latter stream's mouth, the river system measures 3,988 continuous downstream miles—longer than any other. The Mississippi proper rolls 2,470 miles from its source in Lake Itasca, Minnesota. Only the Nile and Amazon have comparable lengths.

Well named *Missi Sipi* ("Great Long River") by the Indians, the turbulent stream and its tributaries drain 19 states and about two-fifths of the area of the United States, as well as parts of Alberta and Saskatchewan in Canada. The tree-like pattern of main streams and branches, which reach from the Appalachian Mountains to the Rockies and from Canada to the Gulf of Mexico, offers over 15,000 water miles which are, or can be, developed for commercial transport.

River Trade Reborn with Barges

Traffic to the value of more than one and a half billion dollars was carried on the Mississippi River system in a recent year. The stream ranks with the Great Lakes in value and quantity of annual water-borne commerce.

By the series of 26 locks and dams on the river above the mouth of the Missouri, a channel of 9-foot depth has been provided up to Minneapolis and St. Paul in Minnesota. Dredging has maintained the navigability of the Mississippi from the delta to the Missouri River mouth. Channel and lock improvements on the Ohio and Missouri now make it possible for a shallow-draft vessel to sail some 4,000 miles from Olean, in southwestern New York State, to Ft. Benton, Montana, almost within the shadow of the Rocky Mountains. The Lakes-to-the-Gulf Waterway, a canal and river route linking Lake Michigan at Chicago with the Mississippi, permits ship traffic between the nation's two chief inland waterway systems.

Now Mississippi tugs and towboats haul trains of steel barges, one tug often handling a load which would require 400 to 600 freight cars. Bulk cargoes, like steel, coal, ores, lumber, oil, and grains, where low freight rates are more vital than speed, move up and down the river in huge quantities. But goods of all kinds now ride the rivers, from beer and canned fruit, cotton, coffee, and sugar, to guano and gasoline. This trade has been built up between the great riverside cities of the Mississippi basin—Minneapolis-St. Paul, St. Louis and East St. Louis, New Orleans, Pittsburgh, Cincinnati, Louisville, Memphis, Vicksburg, and Baton Rouge.

A shortage of the metal would be felt also in such varied fields as gold mining, making storage batteries, filling teeth, and disinfecting seeds.

From about 300 B.C. mankind has been interested in the properties and uses of this contradictory substance—a liquid heavier than lead which does not wet objects put into it, a metal which can be cut with a knife when frozen and which seeps through leather. Because it forms an amalgam with most metals except iron and platinum, it is kept in iron flasks, and measurements of quantity are expressed in terms of flasks containing 76 pounds of it.

The richest mercury mines in the world are the Almaden workings in Spain, about 125 miles southwest of Madrid. Worked by the Romans, they can still produce about as much as the rest of the world combined. Italy now is actually leading the world in mercury production, thanks to the rich Idria deposits acquired from Austria in 1918. Traces of mercury's principal ore, cinnabar, have been found on every continent.

Third-ranking producer is the United States, with about a score of principal mines scattered over seven States, but most of them in California. Used in gold mining, California mercury boomed with the gold rush, and later found a good customer in China's vermilion industry. The United States output (of 18,633 flasks in the last pre-war year) supplies only about half of the country's needs, and extensive imports are necessary. Mercurio Europeo, a combine marketing Spanish and Italian mercury, handles most of the world's commerce in the liquid metal.

Bulletin No. 3, May 5, 1941.

Photograph from the Taylor Instrument Co.

QUICKSILVER'S QUICK ACTION SAFEGUARDS HEALTH

Mercury's quick response to temperature, expanding uniformly with heat and contracting with cold, makes the thermometer a reliable danger signal in case of fevers or other illness. In the factory, a tiny thread of mercury is pumped into the glass, and the thermometer is allowed to cure, or recover from any expansion caused by inserting the mercury. Then the scale of measurement and the figures are added, and the finished instrument is inspected (right).

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)
General Headquarters, Washington, D. C.

Everyday Diamonds That Go To Work

IN THE Burmese language, the same word means "diamond" and "arsenic," because both are feared as poisons. But the United States consumes diamonds like a favorite food. This country imports more than 4,000,000 carats a year, while recalling legends of violence attending the old Koh-i-noor, now in the crown of England's queens, or the mysterious spiriting away of the Great Mogul.

A new chapter in diamond lore began on New York's Fifth Avenue last month, when work began on cutting the Vargas diamond from Brazil, a 726-carat gem, as big as a biscuit, that looks now like frosted glass, but has the distinction of being the third largest ever discovered. (The topnotch diamond for bulk was the fist-sized Cullinan, of 3,024 carats, or almost two pounds.)

Black Diamonds, Unknown to Jewelers, Are Working Man's Treasure

There are numerous flashing diamonds—yellow, brown, green, blue, or red, as well as white—famous in the gem world, which would stoop to serve no function but a king's ransom. The jewels that trouble international politics today, however, are not the flawless beauties in the jeweler's safe, known by name and valued by the hundred thousand dollars, but small, anonymous diamonds sold "by the peck."

More than 70 per cent of the world's diamond mine output may go to work to help the wheels of industry turn. So important to modern machines are these workaday gems that warring nations maneuver for their control somewhat as potentates of India once tried everything from mayhem to massacre for possession of single glittering jewels of treasure size. About 95 per cent of all the diamonds now mined are marketed through, or by working agreement with, a single British firm.

The black diamond, from Brazil's State of Bahia, cinder-colored and unlovely, is the aristocrat of the industrial world, because many authorities rate it the hardest substance in the world. Called carbonado, this smoked-glassy black sheep of the diamond family loudly proclaims its relationship with common graphite, or pencil lead, which, like every diamond, is practically pure carbon. Carbonado is found only in Brazil, where, in 1728, slaves in the gold mines were found using diamond pebbles for stakes in a card game, and a new jewel source was opened up.

Diamond-Studded Tools for Automobile and Plane Manufacture

The United States gets about 90 per cent of its industrial diamonds from Africa, which has been the world's jewel box since Daniel Jacobs' family found a 21-carat diamond among the children's jackrocks in the backyard of their Orange River home, in 1867. For South African gems, in the form of "bort" or flawed stones of little value as jewels, the United States is cash customer No. 1, as this country last year imported $10,884,492 worth of industrial diamonds alone—3,801,130 carats, a third of those marketed. Many of them came from the Belgian Congo, source of 64 per cent of the world's entire output.

In spite of their cost, diamonds are the most economical substance known to industry for innumerable uses, because of their extreme hardness. In wire manufacture, for instance, a diamond die may last for twenty years, remaining accurate to within one-ten-thousandth of an inch. The hole, or die, through the diamond, incidentally, costs seven times as much as the gem itself; the hole may require an entire week of drilling with a needle dipped in diamond dust. Such a die produces the delicate filaments for various sizes of incandescent electric light bulbs, some

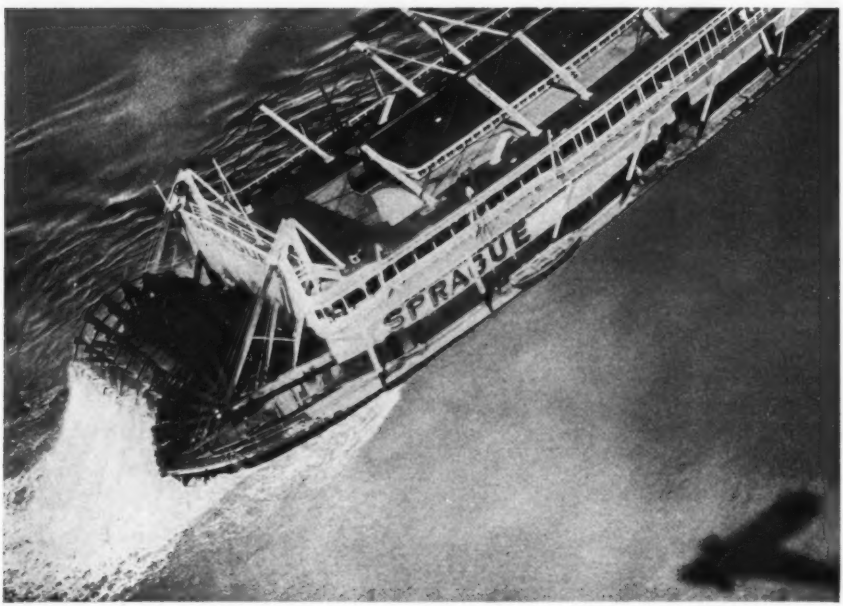
The Mississippi system of rivers, draining a vast, highly-cultivated region of soft rocks and rich soils, much of it abundantly watered, has "thrown its weight around" in a destructive way matched only by the rivers of China. Into the goose-foot pattern of its delta, the Mississippi dumps over 400,000,000 tons of sediment every year. The great flood of 1927 broke Mississippi levees in half a hundred places, flooded an area equivalent to that of Maine, and submerged the homes of 750,000 people. Now the effective new levee system measures 500 miles longer than the Great Wall of China, and in places is 25 times as thick.

Hernando de Soto, in the course of a gold-seeking expedition from Florida through the southeastern and south-central United States, came upon the Mississippi River in May, 1541. In 1673 Fathers Marquette and Joliet reached the big stream from Lake Michigan. La Salle, in 1682, was the first to explore it southward to its mouth. By the American Revolution, and by the Louisiana Purchase in 1803, the United States gained possession of the whole Mississippi basin.

Samuel Clemens, who became a river pilot on his beloved stream, wrote as Mark Twain the classic *Life on the Mississippi*. Today, while excursion steamers feature steam calliopes again, brawny towboat captains feel the march of progress as they sleep in mahogany beds under candlewick spreads.

Note: Additional information and photographs of the Mississippi are found in "Highlights of the Volunteer State," *National Geographic Magazine*, May, 1939; "On Goes Wisconsin," July, 1937; "Men Against the Rivers," June, 1937; "Minnesota, Mother of Lakes and Rivers," March, 1935; "Illinois, Crossroads of the Continent," May, 1931; "Louisiana, Land of Perpetual Romance," April, 1930; "Seeing America with Lindbergh," January, 1928; "The Great Mississippi Flood of 1927," September, 1927; and "Pirate Rivers and Their Prizes," July, 1926.

Bulletin No. 4, May 5, 1941.



Photograph by Lt. Donald E. Keyhoe, U.S.M.C. (Ret.)

LIFE ON THE MISSISSIPPI MEANT STEAMBOATING TO MARK TWAIN

About 1852, at the height of the Mississippi river craft era, 3,307 steamboats landed at St. Louis. Railroads seemed to spell the end of large-scale commerce on the river. But barge and towboat traffic, built up during the World War, has grown to new importance with improvement of navigation on the stream during the last fifteen years. Even the steamboat with "paddles chunkin'" astern, described by Mark Twain, is not extinct, although faster transportation is hinted by the shadow of the plane from which the photograph was made (lower right).

of the wire being practically invisible to the human eye. Four tons of copper can be drawn into wire long enough to reach twenty times around the earth through a diamond die before the hole shows wear.

Diamonds prove priceless in the manufacture of all types of aircraft. Before planes can go into production, keen-edged tools for cutting metals must be prepared, which can be brought to razor-cutting power only with the aid of diamonds. Their chief use, at present, is for a sort of "janitor duty," cleaning the rapidly revolving grindwheels of emery, carborundum, or tungsten carbide. The porous surfaces of these wheels become clogged with minute bits of metal, which destroy their abrasive quality, and can be cleaned only by dressing with a diamond point. Two-fifths of the industrial diamonds are employed in such work.

Another fifth of them enter the mining field, where drilling through hard rock is done by a special bit in a steel cylinder, with a diamond cutting edge.

In the automobile industry, hundreds of differently shaped diamond tools are used. Special "diamond clerks" are responsible for these valuable tools and personally check them in and out of service. Pistons and other motor parts can be turned on a lathe with a diamond-pointed tool to measurements varying less than one-ten-thousandth of an inch from standard. One of the new gear-grinding machines is set with three diamonds, each of 2½ carats.

No diamonds are mined in the United States at present, although the Arkansas mines—the only workings of their kind on the North American continent—have produced more than 10,000 diamonds, weighing up to 40 carats.

Note: South Africa, which supplies about 90 per cent of the United States' industrial diamonds, is described in "Under the South African Union," *National Geographic Magazine*, April, 1931; and "Cairo to Cape Town, Overland," February, 1925.

Bulletin No. 5, May 5, 1941.

DIAMONDS ARE JUST BREAD AND BUTTER TO BANTU WORKMEN IN THE MINES

Mines in the Kimberley district yielded six and a half tons of diamonds in the twenty years after the discovery of the gems in South Africa. One of the mines, now abandoned, was excavated by 12,000 diggers until it was a mile in circumference and a quarter-mile deep. Workmen today who make six-month contracts for mining live inside the barbed-wire barriers of the mine compound, sleeping in sheds of corrugated iron and cooking in the open with long rows of iron pots over wood fires. All mines were reported closed at the outbreak of the war.